

CLAIMS

1. An apparatus for printing a fluid material by means of a continuous jet printing technique, comprising a reservoir for storing the material, a channel connected with the reservoir, which is provided with at least one outflow opening from which, in use, flows a jet of the material breaking up
5 into drops, and a pressure regulating mechanism for varying the pressure of the material upstream of the outflow opening for the purpose of obtaining the jet breaking up into drops, the apparatus being further provided with pressure generating means for passing the material under a predetermined pressure through the channel in the direction of the outflow opening,
10 characterized in that the pressure generating means are arranged for applying the predetermined pressure to the material in the channel hydraulically and/or pneumatically.
2. An apparatus according to claim 1, characterized in that the pressure generating means comprise a gas source coupled to the reservoir and/or the
15 channel via a gas connection.
3. An apparatus according to claim 2, characterized in that the gas source comprises a gas bottle.
4. An apparatus according to claim 3, characterized in that the apparatus is further provided with a plunger pump connected to the gas
20 bottle via a gas connection with a cock, for pressurizing the gas bottle, and that the gas bottle is connected to the reservoir and/or the channel via a cock.
5. An apparatus according to claim 4, characterized in that the gas source comprises a second gas bottle coupled to the reservoir and/or the
25 channel via a gas connection with a cock.

6. An apparatus according to any one of the preceding claims, characterized in that the predetermined pressure is a pressure between 15 and 600 bars.
7. An apparatus according to claim 6, characterized in that the
5 predetermined pressure is a pressure between 100 and 600 bars.
8. An apparatus according to claim 7, characterized in that the predetermined pressure is a pressure between 200 and 600 bars.
9. An apparatus according to claim 8, characterized in that the predetermined pressure is a pressure between 300 and 600 bars.
- 10 10. An apparatus according to claim 9, characterized in that the predetermined pressure is a pressure between 400 and 600 bars.
11. An apparatus according to any one of the preceding claims, characterized in that the pressure regulating mechanism comprises a movable control pin, which control pin can be moved in a longitudinal
15 direction towards/away from the outflow opening.
12. An apparatus according to claim 11, characterized in that an end of the control pin can be placed at a predetermined distance of 15-500 μm from the outflow opening, for varying the pressure adjacent the outflow opening by means of vibration of the control pin.
- 20 13. An apparatus according to claim 11 or 12, characterized in that the movable control pin is situated in the channel, while the longitudinal direction of the control pin is directed substantially perpendicularly to the plane of the outflow opening, and the control pin is laterally supported by a bearing, such as O-rings.
- 25 14. An apparatus according to claim 12 or 13, characterized in that the pressure regulating mechanism comprises a piezo element for driving the control pin.
15. An apparatus according to claim 14, characterized in that the apparatus is provided with a thermal screening element for thermally
30 screening said piezo element from the material in the channel.

16. An apparatus according to any one of the preceding claims, characterized in that a diameter of the outflow opening is in the interval of 20-100 μm .
17. An apparatus according to any one of the preceding claims,
5 characterized in that the apparatus is provided with a heating element, which may or may not be regulable, for heating the material in the channel.
18. An apparatus according to claim 17, characterized in that the heating element is arranged for bringing the material to a temperature which is in the interval of 15-700°C.
- 10 19. An apparatus according to claim 18, characterized in that the heating element is arranged to bring the material to a temperature which is in the interval of 150-300°C.
20. A method for printing a fluid material using a continuous jet printing technique, wherein the material is passed under pressure from a reservoir
15 through a channel to at least one outflow opening of the channel, after which the material is passed through the outflow opening, characterized in that the pressure in at least a part of the channel upstream of the outflow opening is in the interval of 15-600 bars [$\equiv 15 \cdot 10^5$ to $600 \cdot 10^5$ Pa].
21. A method according to claim 22, characterized in that the material at
20 the time of flowing out through the outflow opening has a viscosity which is in the interval of $150 \cdot 10^{-3}$ to $400 \cdot 10^{-3}$ Pa.s.
22. A method for printing a fluid material with an apparatus according to any one of claims 1-19.